

GENERAL INDEX TO VOLUME XXVIII

New scientific names of plants and the final members of new combinations are printed in **bold-face type**; synonyms and page numbers having reference to figures and plates, in *italics*; and previously published names and all other matter, in ordinary type.

A

- Acanthaceae**, Panamanian, 465
Acer *saccharum*, 162, 287, var. *Schneckii*, 162
Acerates, 204; *auriculata*, 207; *circinalis*, 207; *gomphocarpoides*, 207; *hirtella*, 207; *humilis*, 206; *Pringlei*, 206
Acerotis, 204
Aechmea **Allenii**, 411, 478
Allen, Caroline K., Panamanian Gentianaceae determined by, 459
Allen, Paul H., Collections from Panama chiefly by, and by Robert E. Woodson Jr. and Robert W. Schery, 409
Amaryllidaceae, Panamanian, 414
Ampelamus, 208, 211; *albidus*, 211, 212; *ligulatus*, 210
Amphimixis in *Poa pratensis*, 511
Amphistelma, 208
Amphorella, 218; *castanea*, 232
Anantherix, 204
Anderson, Edgar. Binary variation in *Tradescantia bracteata*, 147; The technique and use of mass collections in plant taxonomy, 287; Hugh C. Cutler and. A preliminary survey of the genus *Tripsacum*, 249
Andrews, Henry N. *Dichophyllum Moorei* and certain associated seeds, 375; and Cortland S. Pearsall. On the flora of the Frontier formation of southwestern Wyoming, 165
Anemia, 172; *eocenica*, 172
Anemia elongata, 172; *Fremonti*, 165, 188, 190, forma *fertilis*, 168, 180, 182, 188, 190; *hesperia*, 173, *occidentalis*, 173; *supercretacea*, 173
Anisacanthus, A revision of the North American species of the genus, 385
Anisacanthus, 385, 392; *abditus*, 393, 406; *glaberrimus*, 402; *Gonzalesii*, 394, 406; *Greggii*, 401; *insignis*, 395, 406, 408, var. *linearis*, 396, 408; *juncus*, 399; *pumilus*, 400, 406; *pumilus*, 395; *quadrifidus*, 393, 398, 404, 406; *Thurberi*, 396, 406; *tulensis*, 401, 406; *virgularis*, 398; *Wrightii*, 399, 406, var. *brevilobus*, 400, 406
Annonaceae, Panamanian, 427
Anthanotis, 204
Anthephora *hermaphrodita*, 268; *pubescens*, 269
Anthistiria *gigantea*, 268
Anthopteropsis, 441, 443; *insignis*, 441
Anthopterus, 443
Apocynaceae, Miscellaneous New Asclepiadaceae and, from tropical America, 271; Panamanian, 461
Apomixis in *Poa pratensis*, 504; after first generation, 509; after open pollination, 507; after selfing, 507; chromosome numbers and, 512
Araliaceae, Panamanian, 437
Archibaccharis panamensis, 472
Ardisia coclensis, 453; *geniculata*, 454; *rigidifolia*, 455; *Scheryi*, 456; *Woodsoni*, 457
Asclepiadaceae: The North American, I, Perspective of the genera, 193; from tropical America, Miscellaneous new, 275; Panamanian, 462
Asclepiads: floral structure of, 193; Two new, from the southwestern United States, 245
Asclepias, 204, 216; subg. *Acerates*, 207; subg. *Asclepiodolus*, 207; subg. *Asclepiodora*, 207; *auriculata*, 207; *brachystephana*, 246; *circinalis*, 207; *Cutleri*, 246; *Engelmanniana*, 207; subg. *Euasclepias*, 206; *Fournieri*, 207; *hirtella*, 207; *humilis*, 206; *hypoleuca*, 206; *insignis*, 207; *lanuginosa*, 286; *macrotis*, 246; *Phenax*, 206; subg. *Polyotus*, 207; *Pringlei*, 206; *Ruthiae*, 245; *Scheryi*, 285; subg. *Solanoa*, 207; *Solanoana*, 207; *Sperryi*, 247; *uncialis*, 246; *villosa*, 232; *zanthodacryon*, 207
Asclepiodella, 205
Asclepiodora, 204; *circinalis*, 207; *gomphocarpoides*, 207; *insignis*, 207; *zanthodacryon*, 207

Astephanus, 208, 215; *Grisebachii*, 214;
pubescens, 215; *utahensis*, 215
Astragalus caryocarpus, range of, 336,
360

B

Baiera Lindleyana, 178, 377; *spectabilis*, 178, 377; sp. 178, 184, 186, 377
Balanophoraceae, Panamanian, 427
Basistelmia, 208
Becklesia anomala, 178
Begoniaceae, Panamanian, 434
Beloperone, 389
Benz-pyrene, effect of, on yeast cultures, 2, 4, 14
Berry, Edward Cain. A monograph of the genus *Parmelia* in North America, north of Mexico, 31
Binary variation: in *Tradescantia bracteata*, 147; selective advantages of, 158; probable occurrence of, in other groups of organisms, 162
Biventraria, 205
Blake, S. F., Panamanian plants determined by: *Compositae*, 472; *Polygalaceae*, 432
Blakea brunnea, 435; *intercepta*, 435
Blepharodon, 215; *neriifolium*, 215, 244
Borreri furfuracea, 136
Bromeliaceae, Panamanian, 411
Brown, William L. The cytogenetics of *Poa pratensis*, 493

C

Callaeolepium, 217; *Warszewiczii*, 224
Callipteris flabellifera, 376
Camassia scilloides: Mass collections of, 293; at Meramec Highlands, 293, 298; at New Athens, 293, 298; variability of, 293, of inflorescences, 293, of leaves, 293, 296, of pedicel and internode length, 294, of sepal length and width, 295; f. *Petersenii*, 293
Carbon dioxide: measurement of, evolved during growth of yeast cultures, 11; volumes plotted against time, 17, 18
Carboniferous, plants of the, 171, 375
Carcinogens, Some effects of, on yeasts, 1: on fermentation, 11, 16; on growth, 3, 13, 19; on cell morphology, 25
Carlwrightia, 389
Castellania tropicalis, 2; effect of carcinogens on, 13
Cavendishia Alleni, 445; *calycina*, 447; *chiriquiensis*, 449; *gaultherioides*, 444

Celastraceae, Panamanian, 433
Cenchrus pubescens, 269
Cephaelis chiriquiensis, 469
Ceramanthus, 216
Chilanthemum, 389
Chloris radiata, 268
Cholanthrene, effect of, on *Saccharomyces ellipsoideus*, 1
Chromosome studies: of *Poa pratensis*, 500, 503, 505; of *Tradescantia bracteata*, 160
Chthamalia, 217; *Nummularia*, 229; *pedunculata*, 230; *pubiflora*, 230
Clavija Alleni, 452
Clibadium sessile, 475
Clone; mass collections from a, 289
Coix angulatus, 254; *dactyloides*, 254
Collema exasperatum, 66
Compositae, Panamanian, 472
Coniopteris, 177; *hymenophylloides*, 177
Connaraceae, Panamanian, 430
Connarus Alleni, 430
Conostegia chiriquiensis, 436
Contributions toward a flora of Panama, V. Collections chiefly by Paul H. Allen, and by Robert E. Woodson Jr. and Robert W. Schery, 409
Convolvulaceae, Panamanian, 463
Cornicularia pubescens, 56
Cretaceous, plants of the, 165, 172
Cross-pollination in *Poa pratensis*, 494
Cucurbitaceae, Panamanian, 469
Cunoniaceae, Panamanian, 429
Cutler, Hugh C. and Edgar Anderson. A preliminary survey of the genus *Tripsacum*, 249
Cyatheaceae-Dicksoniaceae, 176
Cyclodon, 218
Cymbopetalum lanugipetalum, 427
Cynanchum, 208; subg. *Ampelamus*, 211; *astephanoides*, 244; *carolinense*, 228; subg. *Cleistolobus*, 215; *cubense*, 213, *cubense*, 214; *Grisebachii*, 214; *Haughtii*, 276; *hirsutum*, 224; *jalsicanum*, 209; *jamaicense*, 210; *laeve*, 211; *lignosum*, 210; *ligulatum*, 210; *maritimum*, 222; subg. *Mellichampia*, 209; subg. *Metalepis*, 213; subg. *Metastelmia*, 214; *obliquum*, 229; *Palmeri*, 210; *prostratum*, 230; *Rensoni*, 210; *rotatum*, 224; *saepimentorum*, 210; *sinaloense*, 210; *subpaniculatum*, 275; subg. *Tylodontia*, 214; *unifarium*, 210; *utahense*, 215; *villosum*, 232; *viridiflorum*, 235; *Watsonianum*, 210
Cystostemma, 216
Cytogenetics of *Poa pratensis*, The, 490
Cytology of yeast cultures, 25

D

- Dactyloides angulatum*, 254; *Dactyloides*, 254
Dactylothea plumosa, 171; Sturi, 171
Decastelma, 208, 215
Desmopsis glabrata, 428
Di-benz-anthracene, effect of, on yeast cultures, 4, 14
Diceratosperma Carpenteriana, 379, 384
Dichophyllum Moorei: and certain associated seeds, 375; occurrence of, 375; restoration of, 380
Dieltia gracilis, 466, 468
Dictyanthus, 217, 218; *aeneus*, 237; *brachistanthus*, 236; *ceratopetalus*, 236; *parviflorus*, 237; *Pavonii*, 237; *prostratus*, 236; *reticulatus*, 236; *stapeliaeflora*, 237; *tigrinus*, 237; *tuberosus*, 237; *yucatanensis*, 237
Digitaria, 252
Dioscoreaceae, Panamanian, 415
Ditassa, 208, 215
Dodge, Carroll William, Bertha Sanford Dodge, and George Thomas Johnson. Some effects of carcinogens on yeasts, 1
Dodge, Bertha Sanford, Carroll William Dodge, and George Thomas Johnson. Some effects of carcinogens on yeasts, 1
Drejera, 386; *Greggii*, 401; *juncea*, 399, 400; *puberula*, 395, 396; *Thurberi*, 396; *Wrightii*, 399
Dryopteris coloradensis, 174

E

- Ecliptostelma*, 243; *molle*, 243
Edisonia, 218; *pubiflora*, 230
Elionurus tripsacoides, 268
Enslenia, 208, *albida*, 211, 212; *jamaicensis*, 210; *ligulata*, 210
Enslinia, 208
Epicion, 208
Epidendrum Allenti, 418, 484; *ellipsophyllum*, 419 484; *gibbosum*, 420, 482; *pendens*, 421, 486; *ramosum* var. *angustifolium*, 422
Epling, C. C., Panamanian Labiatae determined by, 464
Equisetaceae, 178
Equisetum sp., 178, 182
Erickson, Ralph O. Mass collections: *Camassia scilloides*, 293
Eriocaulaceae, Panamanian, 411
Evernia americana, 136, 137; *furfuracea* var. *Cladonia*, 139; *kamtschadalis*, 136, 137
Ezolobus, 238; *albomarginatus*, 242

F

- Faramea Woodsonii*, 470
Fassett, Norman C. Mass collections: *Rubus odoratus* and *R. parviflorus*, 299
Fermentation of *Saccharomyces ellipsoideus*, measurement of, 11, 16, 17, 19, 20
Fernald's "varieties" of *Rubus parviflorus*, 317, 322
Ferns, fossil, 165, 375
Fimbristemma, 238; *calycosa*, 243, 284; *stenosepala*, 243, 284, *Warsceviczii*, 224
Fischeria, 237; *aristolochiaefolia*, 242; *viridis*, 238
Flora of the Frontier formation of southwestern Wyoming, On the, 165
Floral anatomy of *Asclepiads*, 193
Fossil flora: of the Frontier formation of southwestern Wyoming, 165; of Kansas, 375
Frontier formation of southwestern Wyoming: On the flora of the, 165; relation of, to other cretaceous formations, 167
Funastrum, 216; *Torreyi*, 217

G

- Gentianaceae, Panamanian, 459
Geography: correlation of variations in *Rubus odoratus* with, 303, in *R. parviflorus* with, 332
Geology: correlation between characters of *Rubus odoratus* and *R. parviflorus* and, 303; of the Frontier formation of southwestern Wyoming, 166
Gesneriaceae, Panamanian, 465
Ginkgo, 377; *biloba*, 378
Glaciation in relation to occurrence of *Rubus odoratus*, 308, of *R. parviflorus*, 332
Gleason, H. A., Panamanian Melastomaceae determined by, 434
Gleicheniaceae, 174
Gleichenia pectinata, 174
Gleichenites coloradensis, 174, 184, 186, 192; *Gieseckiana*, 175
Glockeria reflexiflora, 465, 466
Glucose, loss of, during growth of yeast cultures, 12, 18
Gomphocarpus, 205; *hypoleucus*, 206; *purpurascens*, 207
Gonolobus, 238; *acuminatus*, 231; *albomarginatus*, 242; *altatensis*, 236; *araneosus*, 222; *aristolochiaefolius*, 242; *arizonicus*, 243; *atratus*, 233; *Baldwynianus*, 228; *bayatensis*, 226;

bicolor, 236; *bifidus*, 230; *biflorus*, 228; *calicicola*, 224; *californicus*, 230; *calycosus*, 242, 284; *carolinensis*, 228; *caudatus*, 233; *chiapensis*, 242; *chihuahuensis*, 232; *chiriquensis*, 462; *chrysanthus*, 222; *congestus*, 224; *ctenophorus*, 243, 283; *cynanchoides*, 228; *dasystephanus*, 243; *decipiens*, 228; *diadematus*, 225; *Ekmanii*, 226; subg. *Eugonolobus*, 242; *flavidulus*, 228; *flocosus*, 222; *fuscoviolaceus*, 462; *gonocarpus*, 212; *gonoloboides*, 243; *guatemalensis*, 235; *hastulatus*, 230; *hirsutus*, var. *flavidulus*, 228; *inconspicuus*, 222; *laevis*, 211; *lanceolatus*, 234; *lanugiflorus*, 282; *Lasiostemma*, 243; *longipetiolatus*, 282; *Lundellii*, 283; *macrophyllus*, 212; *magnifolius*, 225; *maritimus*, 222; *nigrescens*, 233; *nipensis*, 226; *obliquus*, 229, var. *Shortii*, 231; *oblongifolius*, 243; *parviflorus*, 229, var. *brevicoronatus*, 228; *parvifolius*, 230; *patalensis*, 223; *pauciflorus*, 226; *petiolaris*, 223; *picturatus*, 233; *pilosus*, 233; *pogonanthus*, 232; *productus*, 230; *prostratus*, 230; *pseudobarbatus*, 235; subg. *Pseudolachnostoma*, 243; subg. *Pterolobus*, 242; *publiflorus*, 230; *Purpusii*, 223; *reticulatus*, 234; *Schaffneri*, 230; *Shortii*, 231; *Sintenisii*, 226; *stenanthus*, 243; *stenopetalus*, 231; *stenosepalus*, 243, 284; *Steyermarkii*, 283; *suberiferus*, 233; *suberosus*, 212, 222; *tigrinus*, 226; *Tuerckheimii*, 234; *unifarius*, 210; *variifolius*, 226; *velutinus*, 234, var. *calycinus*, 235; *viridiflorus*, 235

Gonolobus, 218

Grass: Kentucky blue, 493; *Tripsacum*, 249

Great Plains environment, relation of, to variability in *Tradescantia*, 158

Growth studies of yeast cultures, 3

H

Hackelochloa granularis, 268

Haemocytometer use of, in counting yeast cells, 7, 19

Hagen, Stanley Harlan. A revision of the North American species of the genus *Anisacanthus*, 385

Halenia euryphylla, 459

Helioestemma, 218

Hemarthria compressa, 268

Herbarium studies, use of mass collections in, 287, 290

Himantostemma, 217; *Pringlei*, 223

Hoffmannia Woodsonii, 471

Hostea, 217

Hybridization in *Tradescantia*, 153

Hypogymnia enteromorpha, 50

I

Ibatia, 217; *maritima*, 223; *mollis*, 223; *muricata*, 223

Illinois bottom-lands, *Camassias* growing in, 293, 296, 298

Imbricaria, 42; *centrifuga*, 68; *conspersa*, 72, f. *isidiata*, 76; *crinita*, 127; *diatrypa*, 43, 44; *dubia*, 90; *encausta*, 53; *enteromorpha*, 50; *incurvus*, 67; *olivacea*, 60; *physodes*, 46; *quercina*, 91; *stygia*, 57

Ipomoea mucronata, 463

Irmischia, 208

Ischaemum aristatum, 268; *glabrum*, 254; *muticum*, 269; *rugosum*, 268

J

Jacobinia, 389

Johnson, George Thomas, Carroll William Dodge, Bertha Sanford Dodge, and. Some effects of carcinogens on yeasts, 1

Jurassic rocks, plants of, 172

Justicia, 385; *coccinea*, 398, 404; *pumila*, 401; *quadrifida*, 398; *superba*, 398, 401; *virgularis*, 398, 404

K

Klukia, 172

L

Labiatae, Panamanian, 464

Labidostelma, 218; *guatemalense*, 224, 281

Lachnostoma, 238; *arizonicum*, 243; *Balbisi*, 232; *gonoloboides*, 243; *Lasiostemma*, 243; *maritimum*, 223; *molle*, 223; *parviflorum*, 229; *prostratum*, 230

Leonard, E. C., Panamanian Acanthaceae determined by, 465

Lichen aspidotus, 63; *Borreri*, 88; *caperatus*, 113, 114; *centrifugus*, 68, 72; *conspersus*, 72; *diatrypus*, 43, 44; *dubius*, 90; *encaustus*, 53, 54; *furaceus*, 137, 138; *incurvus*, 67; *intestinalis*, 50; *laciniatus* var. *physodes*, 45; *laevigatus*, 109; *lanatus*, 56; *olivaceus*, 59; *omphalodes*, 80; *perforatus*, 130; *perlatus*, 122; *pertusus*,

43, 44; *physodes*, 45; *pubescens*, 56; *quercinus*, 91, 92; *saxatilis*, 82; *scorteus*, 92; *stygius*, 57; *tiliaceus*, 91
Lichenoides furfuraceum, 137, 138
 Liliaceae, Panamanian, 414
 Loasaceae, Panamanian, 433
Lobaria furfuracea, 137, 138; *incurva*, 67; *olivacea*, 59; *perlata*, 122, var. *ciliata*, 124; *physodes*, 46; *saxatilis*, 82; *stygia*, 57; *terebrata*, 43; *tiliacea*, 91

Loranthaceae, Panamanian, 426

Lundell, C. L., Panamanian plants determined by: Celastraceae, 433; Myrsinaceae, 453; Rutaceae, 431; Theophrastaceae, 452

Lycopodiaceae, 409

Lygonium, 171

Lyonia, 208

M

Macleania, 443; *epiphytica*, 439

Macroscopis, 217, 218; *congestiflora*, 224; *obovata*, 225

Macrozamia heteromera, 179

Maguire, Bassett, and Robert E. Woodson, Jr. Two new Aselepiads from the southwestern United States, 245

Maisillo, 265

Maize, North American, 249

Malouetia Cuatrecasatis, 274; *lata*, 275

Mandevilla *jasminiflora*, 273; *lanceifolia*, 274; *nerioides*, 274; *Syrinx*, 274

Manisuris cylindrica, 252, 268

Marantaceae, Panamanian, 415

Marsdenia, 201, 243; *astephanoides*, 244; *bicolor*, 236; *Gilgiana*, 244; *neriifolia*, 244; *pseudo-edulis*, 284; *Steyermarkii*, 285

Mass collections: The technique and use of, in plant taxonomy, 287; *Camassia scilloides*, 293; *Rubus odoratus* and *R. parviflorus*, 299; *Tradescantia bracteata*, 149

Matelea, 204, 217; *acuminata*, 225, 231; *adenocardium*, 227; *alabamensis*, 234; *altatensis*, 236; subg. *Amphorella*, 232; *araneosus*, 222; *atrocoronata*, 222; *Balbisi*, 231; *Baldwyniana*, 227; *bayatensis*, 226; *belizensis*, 232; *bicolor*, 236; *biflora*, 228; *brevicoronata*, 228; *calcarata*, 232; *calicola*, 224; *campechiana*, 234; *camporum*, 228; *carolinensis*, 228; *castanea*, 232; *caudata*, 233, 277; *ceratopetala*, 236; *chihuahuensis*, 232; *chrysantha*, 222; subg. *Chthamalia*, 227; *congesta*, 224;

congestiflora, 224; *cordata*, 236; *cordifolia*, 222; *crassifolia*, 236; *crenata*, 233; *cyclophylla*, 233; *cynanchiflora*, 278; *cynanchoides*, 228; *Decasnei*, 232; *decipiens*, 228; *diademata*, 225; *dictyantha*, 236; subg. *Dictyanthus*, 236, 281; *diffusa*, 236; *Ekmanii*, 226; subg. *Eumatelea*, 234, 278; *flavidula*, 228; *floridana*, 229; *fruticosa*, 222; *Gentlei*, 234; *glaberrima*, 281; *gonoloboides*, 222; *grandiflora*, 235; *Greggii*, 229; *guatemalensis*, 235; subg. *HelioSTEMMA*, 233, 276; *Hemsleyana*, 237; *Hintoniana*, 280; subg. *Ibatia*, 222, 281; *inconspicua*, 222; *inops*, 276; subg. *Labiostelma*, 224, 280; *lanata*, 225; *lancoolata*, 234; *leptogenia*, 232; *Le Sueurii*, 229; subg. *Macroscopis*, 224; *magnifolia*, 225; *maritima*, 222; *megacarpa*, 236; subg. *Microdaetylon*, 236; *mollis*, 223; *nigrescens*, 233; *nipensis*, 226; *Nummularia*, 229; *obliqua*, 229; *oblongata*, 226; *obovata*, 225; *ovatifolia*, 225; subg. *Pachystelma*, 236; *parviflora*, 229; *parvifolia*, 230; *patalensis*, 223; *pauciflora*, 226; *Pavonii*, 237; *pedunculata*, 230; *petiolaris*, 223; subg. *Pherotrichia*, 231; *picturata*, 233, 277; *pilosa*, 233; *pinguifolia*, 235; *Pittieri*, 234, 277; subg. *Poicilla*, 225; subg. *Polystemma*, 232; *porphyrantha*, 223; *Pringlei*, 223; *producta*, 230; *Prosthecidiscus*, 223; *prostrata*, 230; *pseudobarbata*, 235; subg. *Ptycanthera*, 225; *pubiflora*, 230; *pueblensis*, 223; *Purpusii*, 223; *Quirosii*, 224, 281; *reticulata*, 234; *rupestris*, 232; *Schaffneri*, 230; *scopulorum*, 232; *Shortii*, 231; *Sintenisii*, 226; *Standleyana*, 237; *stapeliaeiflora*, 237; *stenopetala*, 231; *Steyermarkii*, 278; *tamniifolia*, 225; *tenuis*, 279; subg. *Tiarastemma*, 232; *tigrina*, 226; *tinctoria*, 277; subg. *Trichosaeme*, 225; *tristiflora*, 223; *tuberosa*, 237; *Tuerckheimii*, 234; *umbellata*, 223; *Valliana*, 231; *variifolia*, 226; *velutina*, 234; *violacea*, 280; *viridiflora*, 235; *Warszewiczii*, 224; *Wootonii*, 231; *yucatanensis*, 237

Maxillaria Biolleyi, 425; *Bradeorum*, 425; *fulgens*, 425; *umbratilis*, 425

Maxon, W. R., Panamanian plants determined by: Lycopodiaceae, 409; Polypodiaceae, 409

Media used in growing yeasts, 3

Meiosis in *Poa pratensis*, 502
 Melastomaceae, Panamanian, 434
Mellichampia, 208; *ligulata*, 210; *rubescens*, 210; *sinaloensis*, 210
Menegassia, 43; *physodes*, 46
 Meramee Highlands, Mo., mass collections of *Camassia scilloides* from, 293, 298
Meriania panamensis, 436
Metalepsis, 208; *cubensis*, 213, 214, 275
Metastelma, 208, 214
 Methyl cholanthrene, effect of, on yeast cultures, 2, 4, 14, 18
Microdactylon, 218; *cordatum*, 236
 Microorganisms, measurements of growth of, 5
Microstelma, 204
Microtaenia, 176; *paucifolia*, 165, 176, 182; *variabilis*, 176, 177, 182
 Miscellaneous new Asclepiadaceae and Apocynaceae from tropical America, 271
 Moldenke, H. N., Panamanian plants determined by: Eriocaulaceae, 411; Verbenaceae, 464
 Monograph of the genus *Parmelia* in North America, north of Mexico, 31
 Morton, C. V., Panamanian plants determined by: Dioscoreaceae, 415; Gesneriaceae, 465; Solanaceae, 464
Myocandida onychophila, 2; effect of carcinogens on, 13
 Myrsinaceae, Panamanian, 453

N

Nanaturis, 208
Nephradenia, 243; *fruticosa*, 244; *neriifolia*, 244
 New Athens, Ill., mass collections of *Camassia scilloides* from, 293, 298
 North American Asclepiadaceae, I. Perspective of the genera, 193
 Nunataks, survival of thimbleberry on, 299, 332, 345

O

Odontonema, 389, 402
Odontostephana, 218; *Baldwiniana*, 228; *carolinensis*, 228; *decipiens*, 228; *flavidula*, 229; *floridana*, 229; *obliqua*, 229; *Shortii*, 231
Oligoron, 204
Onistia, 204
 Open-pollination in *Poa pratensis*, 497; apomixis after, 507
 Orchidaceae, Panamanian, 415
Orthosia, 208; *acuminata*, 225; *oblongata*, 226

Otanema, 204
Otaria, 204
 Oxalidaceae, Panamanian, 431
Oxalis coccinea, 431
Oxypetalum, 208; *cordifolia*, 208
Oxypteryx, 205
 Ozarks: *Camassias* growing in, 293, 296, 298

P

Pachystelma, 218; *cordatum*, 236
Palmorchis trilobulata, 415, 480
 Panama, Contributions toward a flora of, V. Collections chiefly by Paul H. Allen, Robert E. Woodson, Jr. and Robert W. Schery, 409
 Parathesis Woodsoni, 458
Parmelia, A monograph of the genus, in North America, north of Mexico, 31: chemical reactions, 38; ecology, 32; history, 31; morphology, 34; taxonomy, 41
Parmelia, 41; *acanthifolia*, 79; *ambigua*, 141, var. *Halci*, 141; *americana*, 136, 137; *Amphigymnia* (*Euparmelia* sect.), 112; *Amphigymnia* (sect.), 112; *arisonica*, 141; *aspidota*, 63; *atrofusca*, 141; *aurulenta*, 110; *Bolliana*, 90; *Borreri*, 88; *Borreri* var. *hypomela*, 88, var. *rudecta*, 96; *camtschadalis f. americana*, 136, 137; *Canalicularia* (sect.), 135; *caperata*, 113, var. *incorrupta*, 118, var. *subglauca*, 119; *caroliniana*, 106; *centrifuga*, 68; *ceratophylla* var. *phyllodes*, 46; *cetrarioides*, 125, var. *rubescens*, 127; *cetrata*, 100, var. *subsidiosa*, 101; *chlorochroa*, 70; *ciliata*, 124; *cirrhata*, 136; *Cladonia*, 139; *colpodes*, 141; *conspersa*, 72, var. *isidiata*, 76; *conspersa f. isidiata*, 76; *conspureata*, 65; *oridellata*, 52, 53; *crinita*, 127; *cristifera*, 129; *cubensis*, 108; *dubia*, 90; *encausta*, 53; *endoleuca*, 67; *endoxantha*, 110; *enteromorpha*, 50; *erecta*, 103; *Euparmelia* (subgen.), 55; *Euparmelia* (subgen.), 42; *Everniaeformes* (*Euparmelia* sect.), 135, 136, 141; *Everniiformes* (subgen.), 135; *Everniiformes* (sect.), 135; *exasperata*, 66; *Finkii*, 106; *flavicans*, 121; *Frankliniana*, 141; *frondifera*, 132; *furfuracea*, 137; *Halseyana*, 141; *Herreana*, 121; *Herrei*, 88; *horensens*, 85; *Hubrichtii*, 102; *Hypogymnia* (subgen.), 45; *Hypotrachyna* (*Euparmelia* sect.), 79; *Hypotrachyna* (sect.), 79; *Imbricaria* (sect.),

- 42; *incorrupta*, 118; *incurva*, 67; *laevigata*, 109; *latissima*, 134; *leio-
carpa*, 96; *leucochlora*, 78; *lineola*,
77; *livida*, 105; *Lobaria* (sect.), 42;
Lobaria sect. *Imbricaria*, 42; *lophyrea*,
52; *margaritata*, 141; *Melanopar-
melia* (*Euparmelia* sect.), 55; *Melano-
parmelia* (sect.), 55; *Menegazzia*
(subgen.), 42; *Michauxiana*, 124;
molliscula, 71; *multispora*, 64; *Nepa-
lensis*, 136, 137; *olivacea*, 59, var.
aspidota, 63, var. *glabra*, 64; *olivacea*
var. *corticola* f. *conspurcata*, 65;
*olivacea** *corticola* var. *glabra*, 64, var.
multispora, 64, var. *polyspora*, 64, var.
prolixa, 58; *olivaria* f. *ceptrarioides*,
125; *omphalodes*, 80; *perforata*, 130,
var. *hypotropa*, 132; *perlata*, 122,
var. *ciliata*, 124; *perlata* var. *flavicans*,
121, f. *rubescens*, 127; *pertusa*, 43;
physodes, 45, var. *labrosa*, 49, var.
obscura, 49, var. *platyphylla*, 49, var.
vittata, 49; *physodes* var. *encausta*,
53, var. *enteromorpha*, 50, var. *vul-
garis*, 46; *praesignis*, 119; *praeter-
visa*, 133; *proboseidea*, 132; *prolixa*,
58; *Pseudevernia* (subgen.), 135;
pubescens, 56; *quercina*, 91; *reticu-
lata*, 99; *rudecta*, 96; *rudrata*, 96;
saxatilis, 82, var. *Anzi*, 85; *saxatilis*
var. *leucochroa*, 82, var. *omphalodes*,
80; *sinuosa* var. *laevigata*, 109;
soredica, 120; *sphaerosporella*, 71;
stuppea, 141; *stygia*, 57; *subglauca*,
119; *sublaevigata*, 107; *sublinearis*,
79; *submarginalis*, 124; *subolivacea*,
60; *sulcata*, 86; *sulphurea*, 112; *tex-
ana*, 95; *tiliacea*, 91, var. *sublaevi-
gata*, 107, var. *sulphurea*, 112; *tinc-
toria*, 133; *vagans*, 71; *villosa*, 135;
Xanthoparmelia (*Euparmelia* sect.),
66; *Xanthoparmelia* (sect.), 67
- Parmotrema*, 112, 113
Partula suturalis, progressive variation
in, 308; map showing, 352
Pattalia, 208; *Palmeri*, 210
Pearsall, Cortland S., Henry N. Andrews
and. On the flora of the Frontier for-
mation of southwestern Wyoming, 165
Pentagonium, 216
Peperomia Scheryi, 426
Peptone, growth of yeasts on, 3
Pherotrichis, 217; *Balbisi*, 232; *lepto-
genia*, 232; *Schaffneri*, 232
Philibertella, 216; *tomentella*, 217; *Tor-
reyi*, 217
Philibertella, 216; *Torreyi*, 217
Physcia, 42
Piper *fagopyricarpum*, 426
Piperaceae, Panamanian, 426
Platisma caperatum, 113, 114; *perfora-
tum*, 130
Pleurothallis macrantha, 417, 482
Poa pratensis, The cytogenetics of, 493:
apomixis in, 504; chromosomes of,
500, 503, 505; genetics of various
genoms, 513; progeny of, 494, result-
ing from open-pollination, 497, 516,
520, from selfing, 497 518, 522; vari-
ation in, 496, 498
Podocarpus Allenii, 409
Podostemma, 205
Podostigma, 204
Pogonatherum saccharoideum, 269
Poicilla, 217; *acuminata*, 226; *oblon-
gata*, 226; *ovatifolia*, 225; *tamniifolia*,
225
Poicillopsis, 218; *acuminata*, 226; *ob-
longata*, 226
Pollination in *Poa pratensis*, 497
Polygalaceae, Panamanian, 432
Polyotus, 204
Polypodiaceae, 174; Panamanian, 409
Polystemma, 217; *rupestre*, 232; *scopu-
lorum*, 233; *viridiflora*, 232
Polytoca semiteres, 269
Prairie environment, relation of varia-
tion in *Tradescantia bracteata* to, 158
Preglacial relief, *Rubus parviflorus* as a,
299, 332
Prosthecidiscus, 218; *Berterii*, 225;
guatemalensis, 223
Psammisia, 443, *panamensis*, 440
Pseudevernia, 135, 141; *furfuracea*, 138
Psittacanthus Scheryi, 426
Psygmodophyllum, 377; *cuneifolium*, 378;
Kidstoni, 378; *Grosserti*, 378
Ptycanthera, 217
Ptychanthera Berterii, 225, 226; *mollis*,
223; *oblongata*, 226; *ovatifolia*, 225
- Q
- Quadracasaea*, 271; *caquetensis*, 272;
inaequilateralis, 272
- R
- Rauwolfia sarapiquensis*, 271
Revision of the North American species
of the genus *Anisacanthus*, 385
Rothrockia, 217; *cordifolia*, 222; *fruti-
cosa*, 222; *umbellata*, 223
Rottboellia hirsuta, 268, 269; *Myurus*,
269
Roulinia, 208; *ligulata*, 210; *Palmeri*,
210; *Rensoni*, 210; *sinaloensis*, 210;
unifaria, 210

- Rouliniella*, 208, 211; *jaliscana*, 209; *jamaicensis*, 210; *lignosa*, 210; *Palmeri*, 210; *unifaria*, 210
- Rubiaceae, Panamanian, 469
- Rubus*, 299; *columbianus*, 302; *f. Eubatus*, 321; *idaeus*, 308; *nutkanus* β *Nuttallii*, 323, var. *parvifolius*, 323, var. *scopulorum*, 323; *odoratus*, 300; *parviflorus*, 314; *strigosus*, 308
- Rubus odoratus*: geographic occurrence of forms in mass collections, 303; variation in, 300, correlation of, with geography, 306, kinds of, 300; taxonomy of intraspecific, 302; *f. bifarius*, 302; var. *columbianus*, 302; *f. glabrifolius*, 302; *f. heteradenius*, 302; *f. hypomalacus*, 302; var. *mala-chophyllus*, 302; *f. paraheteradenius*, 303; *f. parahypomalacus*, 303; *f. scopulorum*, 302
- Rubus odoratus* and *R. parviflorus*: mass collections of, 299; maps showing locations of, 347-367; habitats of, 368-374
- Rubus parviflorus*: aggressiveness of, 336; forms of, 322, in mass collections, 327; kinds of variation, 314; "varieties" of, 317; *f. acephalus*, 325; *f. adenius*, 324; *f. allocalyx*, 324; *f. bifarius*, 323; var. *bifarius*, 318, 323; var. *genuinus*, 317, 324; var. *grandiflorus*, 318, 323; var. *glabrifolius*, 328; *f. heteradenius*, 323; var. *heteradenius*, 318, 323; *f. hypomalacus*, 318; var. *hypomalacus*, 318, 323; *f. micradenius*, 324; *f. Nuttallii*, 323; var. *parvifolius*, 319, 323; *f. scopulorum*, 323; var. *scopulorum*, 319, 323; *f. trichophorus*, 324; var. *velutinus*, 318, 324, 325, *f. isohypomalacus*, 325, *f. parahypomalacus*, 325, *f. paramicradenius*, 326, *f. paratrachophorus*, 325, *f. parbifarius*, 325, *f. parvillosus*, 325, *f. prae-bifarius*, 325; *f. villosus*, 324
- Ruffordia* Goepfertii, 173
- Rutaceae, Panamanian, 431
- Eytidoloma*, 217; *reticulata*, 236
- S
- Sacaton, 265
- Saccharomyces ellipsoideus*, effect of carcinogens on, 1; cell differentiation of, 25; fermentation of, 11, 16; growth of, 3, 13; morphology of, 2; population studies, 19
- Samaropsis, 379
- Sarcostemma*, 216; *tomentella*, 217; *Torreyi*, 217
- Satyria Allenii*, 451
- Scaphyglottis *Lindeniana*, 423; *tenella*, 423, 428
- Schefflera epiphytica*, 437
- Schery, Robert W., Robert E. Woodson, Jr. and. Contributions toward a flora of Panama, V. Collections chiefly by Paul H. Allen and by Robert E. Woodson, Jr. and Robert W. Schery, 409
- Schizaena*, 171; *elegans*, 172
- Schizaeaceae, 168; fossil history of the, 171
- Schizaeopsis expansa*, 172
- Schizaeopteris *mezozoica*, 172
- Schizonotus*, 205; *purpurascens*, 207
- Schubert, B. G., L. B. Smith and. Panamanian Begoniaceae determined by, 434
- Seeds, *Dichoplyllum Moorei* and certain associated, 375, 379
- Selfing in *Poa pratensis*, 497, 518, 522; apomixis after, 507
- Senftenbergia pinnaeformis*, 171; *Sturi*, 171
- Seutera*, 208
- Smith, A. C., Panama plants determined by: Araliaceae, 437; Vacciniaceae, 438
- Smith, L. B., Panamanian Bromeliaceae determined by, 411; and B. G. Schubert, Panamanian Begoniaceae determined by, 411
- Solanaceae, Panamanian, 464
- Solanoa*, 205; *purpurascens*, 207
- Solanoana*, 205; *purpurascens*, 207
- Southwestern United States, Two new *Asclepiads* from the, 245
- Squamaria stygia*, 57
- Standley, P. C., Panamanian plants determined by: Rubiaceae, 469; Taxaceae, 409
- Stelmagonum*, 204
- Stemmadenia Allenii*, 461
- Steyermark, J. A., Panamanian plants determined by: Connaraceae, 430; Gentianaceae, 460
- Stylandra*, 204
- Sugar, loss of, during growth of yeast cultures, 12
- T
- Tainionema*, 208
- Tassadia*, 208
- Taxaceae, Panamanian, 409
- Taxonomy: plant, The technique and use of mass collections in, 287; of intraspecific variation in *Rubus odoratus* and *R. parviflorus*, 302

- Tetracustelma*, 217; *prostrata*, 230
Theophrastaceae, Panamanian, 452
Thibaudia, 443
Thimbleberry: habitats of, 299, 368-374; mass collections of, 299; occurrence on nunataks, 299, 332, 345; ranges of, 303, 347 367; variation in, 299, 306, 314
Trachys mucronata, 269
Tradescantia bracteata: Binary variation in, 147; cytology of, 160; mass collections of, 150; type A, 147, 148; type B, 148, 149; *hirsutiflora*, 151; *virginiana*, 147, 151
Trelease, William, Panamanian Piperaceae determined by, 426
Trichosacme, 217; *lanata*, 225
Trichostelma, 238; *ciliatum*, 242, 284; *oblongifolium*, 243
Tripsacum, A preliminary survey of the genus, 249
Tripsacum, 252; *acutiflorum*, 260; *aegilopoides*, 268; *aristatum*, 268; *australe*, 253, 259; *avenacea*, 268; *ciliare*, 268; *compressum*, 254, 268; *cylindricum*, 268; *dactyloides*, 253, 254, var. *occidentale*, 258; *dactyloides* var. *angustifolium*, 260, *floridanum*, 252; subsp. *hispidum*, 259, 260, var. *Lemmoni*, 260, var. *monostachyon*, 254, var. *monostachyum*, 254; *distachyum*, 268; *distichum*, 268; *fasciculatum*, 253, 264; *fasciculatum*, 264, 268; *floridanum*, 252, 253, *giganteum*, 268; *granulare*, 268; *hermaphroditum*, 268; *hirsutum*, 269; *lanceolatum*, 253, 260; *lanceolatum*, 260; *latifolium*, 253, 267; *laxa*, 269; *laxum*, 264; *Lemmoni*, 260; *monostachyum*, 254; *mucronatum*, 269; *muticum*, 269; *myuros*, 269; *panicum*, 269; *pilosum*, 253, 265; *pubescens*, 269; *semiteres*, 269
Tristachya avenacea, 268; *laxa*, 269
Tropical America, Miscellaneous new
Asclepiadaceae and *Apocynaceae* from, 271
Tylothontia, 208; *cubensis*, 214
Tympananthe, 217; *suberosa*, 237
- U
- Urostephanus*, 217; *gonoloboides*, 222
- V
- Vacciniaceae*, Panamanian, 438
Variation: binary, in *Tradescantia bracteata*, 147; in *Poa pratensis*, 493; use of mass collections in study of, 150, 287; in *Camassia scilloides*, 293; in *Rubus odoratus*, 300, and *R. parviflorus*, 314, correlation of, with geography, 306, relation of, to environment, 158, 296; taxonomy of intraspecific, 302
Verbenaceae, Panamanian, 464
Vincetoxicum, 218, 238; *acuminatum*, 231; *adenocardium*, 227; *alabamense*, 234; *astephanoides*, 244; *atrocoronatum*, 222; *Baldwinianum*, 228; *belisense*, 232; *biflorum*, 228; *calcaratum*, 232; *calicicola*, 224; *campechianum*, 234; *camporum*, 228; *carolinense*, 228; *caudatum*, 233; *chiapense*, 242; *chihuahuense*, 232; *chiriquense*, 280; *chrysanthum*, 222; *congestum*, 224; *crassifolium*, 236; *crenatum*, 233; *ctenophorum*, 243; *cyclophyllum*, 233; *cynanchoides*, 228; *dasystephanum*, 243; *diadematum*, 225; *discolor*, 234; *flavidulum*, 229; *floridanum*, 229; *Gentlei*, 234; *grandiflorum*, 235; *Grayanum*, 233; *Greggii*, 229; *hastulatum*, 230; *LeSueurii*, 229; *Lundellii*, 243; *magnifolium*, 225; *megacarpum*, 236; *nigrescens*, 233; *obliquum*, 229; *parviflorum*, 230; *petiolare*, 223; *pilosum*, 234; *pinguifolium*, 235; *Pittieri*, 234; *porphyranthum*, 223; *productum*, 230; *pubiflorum*, 230; *pueblensis*, 223; *quercetorum*, 234; *Quirosii*, 224; *reticulatum*, 234; *saepimentorum*, 210; *Shortii*, 231; *Sintenisii*, 226; *stenanthum*, 243; *stenopetalum*, 231; *stenophyllum*, 234; *suberiferum*, 234; *torum*, 243; *trichoneuron*, 234; *tristiflorum*, 223; *variifolium*, 226; *velutinum*, 235; *viridiflorum*, 235; *Wootonii*, 231
Vitaceae, Panamanian, 433
Voyria Allenii, 460
- W
- Weinmannia pseudolaurina*, 429
Williams, L. O., Panamanian Orchidaceae determined by, 415
Woodson, Robert E., Jr. Miscellaneous new *Asclepiadaceae* and *Apocynaceae* from tropical America, 271; The North American *Asclepiadaceae*. I. Perspective of the genera, 193; and Bassett Maguire. Two new *Asclepiads* from the southwestern United States, 245; and Robert W. Schery. Contributions toward a flora of Panama. V. Collections chiefly by Paul H. Allen and by Robert E. Woodson, Jr. and Robert W. Schery, 409

Wyoming, southwestern, On the flora of
the frontier formation of, 165

Yeasts, Some effects of carcinogens on, 1

Y

Yeast cultures: cell differentiation in,
25; effect of various carcinogens on,
14; fermentation of, 11, 17, 17-20;
growth of, 3, 13, 14, 16; population
studies, 19, 21, 22

Z

Zanthoxylum Scheryi, 431

Zea, 249

Zosima, 216

Zygopetalum parviflorum, 424, 490

Zymonema capsulatus, 2; dermatitidis,
2, effect of carcinogens on, 13

